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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,776	12/30/2003	Valery M. Dubin	42P17745	1065
8791	7590	07/19/2006		
BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030			EXAMINER ABRAMOWITZ, HOWARD E	
			ART UNIT 1762	PAPER NUMBER

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/749,776

Applicant(s)

DUBIN ET AL.

Examiner

Howard E. Abramowitz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 31-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 31-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendments filed 5/2/06, have been fully considered and reviewed by the examiner. The examiner notes that claims 10-30 have been canceled, claims 31-34 have been added and claims 1 and 7 have been amended. Currently claims 1-9 and 31-34 are pending in this office action.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 31-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Holko (US Patent No. 5,358,547).

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Referring to claim 1, Holko discloses forming a layer on top of a substrate comprising a metal portion (column 1 lines 32-36). The metal capping layer comprising a group VIII metal, cobalt, and carbon and silicon (see tables A and B particularly table B #5 where Nicrobraz 125 is used as the ingredient, it contains Cr, Si, C and B).

Referring to claim 2, the group VIII metal is cobalt (see table B).

Referring to claim 3 the capping layer can include a refractory metal such as Mo and Si and C see table A.

Referring to claim 4, the alloys may be applied to the metal substrates by electroless plating (column 4 lines 49-55).

Referring to claims 31 and 32 the cobalt can be alloyed with Cr and Mn (tables A and B column 6 lines 40-54).

Referring to claim 33 and 34 the coatings can comprise B and phosphorous (tables A and B).

Claims 1, 2, 4-6, 33 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Sambucetti et al. (US Patent No. 6,573,606).

Referring to claim 1 Sambucetti teaches coating a copper interconnect with a film that can comprise Co, Si and B or P (column 2 lines 33-58).

Referring to claim 2 the Co is the group VIII metal used (column 2 lines 33-58).

Referring to claim 4, the metal capping layer is formed by electroless plating (column 4 lines 10-15).

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Referring to claim 5 the thickness of the layer is 50-300 angstroms (column 4 lines 15-22).

Referring to claim 6 the invention places a metal capping layer on a copper interconnect line.

Referring to claims 33 and 34 the capping layer can comprise boron and phosphorous (column 2 lines 33-58).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qiao et al. (US Patent No. 6,803,318).

Referring to claims 1, 2 and 7-9, Qiao discloses that a layer of conductive material (16) may be deposited on the gate dielectric (14). While this is not a deposition on a metal layer the layer 16 may in fact be composed of multiple layers including a copper layer (column 13 lines 16-33). This multilayer stack may also include a silicide formed from PECVD of a silane precursor over a cobalt layer (column 13 lines 34-67). Qiao does not disclose forming the metal copper layer followed by forming the cobalt silicide. However, this is one of the possibilities since Qiao teaches forming a copper layer in layer 16 and forming a cobalt silicide in layer 16 either the copper layer would be deposited below the cobalt silicide or above the cobalt silicide. Accordingly, since there are only two possibilities it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the copper layer beneath the cobalt silicide as it would have a reasonable expectation of successfully functioning as a layer of conductive material.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard E. Abramowitz whose telephone number is 571-272-8557. The examiner can normally be reached on monday-friday 9:00-5:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on 571-272-1423. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
HEA

  
TIMOTHY MEEKS  
SUPERVISORY PATENT EXAMINER